

MASS. HS30.1302: L95



312066 0282 3936 2

**DRAFT**  
**FOR PUBLIC COMMENT**

**Low-Level Radioactive Waste Minimization  
Regulations**

**Part M1**

GOVERNMENT COLLECTIONS  
AUG 24 1993  
University of Massachusetts  
Depository Copy



THE COMMONWEALTH OF MASSACHUSETTS  
Department of Public Health  
Radiation Control Program  
305 South Street  
Jamaica Plain, MA 02130  
(617)727-6214  
FAX: (617)727-2098

931/343



## EXECUTIVE SUMMARY

### Introduction

The proposed regulations will require all radioactive material users and generators of low-level radioactive waste to examine their operations and institute waste minimization programs where appropriate.

Chapter 549 of the Act of 1987 established M.G.L. Chapter 111H, the Massachusetts Low-Level Radioactive Waste Management Act of 1987 (Act). This Act, in addition to establishing a process for management of low-level radioactive waste within the Commonwealth, also required the Department of Environmental Protection and the Department of Public Health to establish regulations. These regulations represent the Department of Public Health's regulatory requirements under phase one of the act.

These regulations are a companion piece to the proposed draft regulations entitled Part M on the licensing and operational requirements for low-level radioactive waste facilities (105 CMR 120.800). While Part M regulations are modeled on the Suggested State Regulations for the Control of Radiation by Conference Of Radiation Control Program Directors, Inc., a model for Part M1 does not exist. These draft regulations (Part M1) are in response to additional requirements of the Massachusetts Low-Level Radioactive Waste Management Act of 1987. The Department of Public Health Department is required to promulgate regulations requiring users of radioactive materials within the Commonwealth to develop plans and procedures for minimizing the amount of radioactive material used, as well as the volume of radioactive waste needing disposal. These draft regulations have been developed utilizing guidance material from E.G.&G. Idaho, the U.S. Department of Energy's low-level radioactive waste consultant, and additional guidance from the Massachusetts Low-Level Radioactive Waste Management Board.

It should be noted that a major concern of the Massachusetts Low-Level Radioactive Waste Legislative Commission in developing the Low-Level Radioactive Waste Management Act, was that the Commission should not only develop strict regulatory control in the areas of treatment, storage and disposal of low-level radioactive waste, but also develop strong regulatory programs to reduce the volume of waste generated within the Commonwealth. This approach, taken by Massachusetts represents a significant difference from the federal government approach in managing low-level radioactive waste.

## Description of the Proposed Regulation

The proposed regulations will be combined with the Department's draft comprehensive radiation control regulations (Parts A through W) which have already been through public hearings and will be finalized shortly. It is important to realize that the final Part M1 regulations will appear codified as 105 CMR 120.850 as part of the complete regulations for the control of radiation (Parts A through W) which will be codified as 105 CMR 120.000.

The proposed regulations cover:

1. Plans -- Generators of low-level radioactive waste would be required to develop source and volume minimization plans for review by the Department.
2. Applicability -- Persons who generate 100 cubic feet or more of low-level radioactive waste per year requiring disposal must also develop and institute waste minimization programs based on these plans.
3. Licensing -- Licensees must submit copies of the minimization plan to the Department with annual updates.
4. Other Generators -- As generators who do not have a license under other applicable Department regulations but require access to a waste facility must also submit plans to the Department.
5. Certificate -- The Department shall issue a certificate to indicate approval of source and volume minimization plans.

Part M1

LOW-LEVEL RADIOACTIVE WASTE MINIMIZATION REGULATIONS

Table of Contents

GENERAL PROVISIONS . . . . .	M1-1
M1.10: Purpose and Scope . . . . .	M1-1
M1.20: Regulatory Authority . . . . .	M1-1
M1.30: Definitions . . . . .	M1-1
M1.40: Enforcement . . . . .	M1-4
M1.50: Objectives . . . . .	M1-4
M1.60: Statement and Plan Requirements . . . . .	M1-5
M1.70: Waste Minimization Plan Content . . . . .	M1-6



Digitized by the Internet Archive  
in 2014

[https://archive.org/details/lowlevelradioact00mass\\_0](https://archive.org/details/lowlevelradioact00mass_0)



## GENERAL PROVISIONS

### M1.10: Purpose and Scope

(a) The purpose of these regulations is to ensure that source and volume minimization and storage for decay are integral parts of every radioactive material user's, as well as generator's, waste management program. The regulations in this Part (M1) have been made, after consultation with the Board, as required in M.G.L. c.111H, § 13.

(b) These regulations apply to all radioactive material users, licensees and generators as defined in M1.30.

(c) These regulations do not apply to radioactive materials that are exempt from licensing as specified in Part C of 105 CMR 120.000.

(d) The requirements of this Part are in addition to, and not in substitution for, Parts A,C,D and M of 105 CMR 120.000.

### M1.20: Regulatory Authority

The authority for the Department of Public Health to promulgate these regulations is found in :

- M.G.L. c.111, §§ 3, 5M, 5N, 5O, 5P;
- M.G.L. c.111H, §§ 1, 7, 8, 11, 13, 16, 31.

### M1.30: Definitions

As used in this Part, the following definitions apply:

"Act" means The Massachusetts Low-Level Radioactive Waste Management Act of 1987, M.G.L. c.111H.

"Board" means the Low-Level Radioactive Waste Management Board established in section two of the Act.

"Curie" means a unit of quantity of radioactivity. One curie (Ci) is that quantity of radioactive material which decays at the rate of  $3.7 \times 10^{10}$  transformations per second (tps). Commonly used submultiples of the curie are the millicurie and the microcurie. One millicurie (Mci) = 0.001 curie =  $3.7 \times 10^7$  tps. One microcurie ( $\mu$ Ci) = 0.000001 curie =  $3.7 \times 10^4$  tps.

"Department" means the Department of Public Health.

"Disposal" means the isolation of radioactive waste from the biosphere inhabited by human beings and their food chains.

"Generator" means a person, including a broker, who produces low-level radioactive waste.

"Generator guidance" means the document titled "Low-Level Radioactive Waste Minimization Guidance" compiled by Massachusetts Department of Public Health for the guidance of waste generators.

"Half-life" means the time in which half the atoms of a particular radioactive substance disintegrate to another nuclear form.

"Hazardous waste" means a waste, or combination of wastes, which because of its quantity, concentration, or physical, chemical or infectious characteristics may cause, or significantly contribute to an increase in serious irreversible, or incapacitating reversible illness or pose a substantial present or potential hazard to human health, safety, or welfare or to the environment when improperly treated, stored, transported, used or disposed of, or otherwise managed, however, not to include solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under section 402 of the Federal Water Pollution Control Act of 1967 as amended, or source, special nuclear, or by product material as defined by the Atomic Energy Act of 1954.

"Licensee" means a person holding a license issued pursuant to Part C of 105 CMR 120.000 by the Department of Public Health to transfer, acquire, own, possess or use quantities of, or devices or equipment utilizing, radioactive material.

"Low-level radioactive waste" means radioactive material that (1) is neither high-level waste, nor spent nuclear fuel, nor byproduct material as defined in section 11(e)(2) of the Atomic Energy Act of 1954, as amended, 42 USC section 2014(e); and (2) is classified by the Federal Government as low-level radioactive waste, but not including waste which remains a federal responsibility, as designated in section 3(b) of the Low-Level Radioactive Waste Policy Act, as in effect as of the effective date of the Act, as amended, 42 USC Section 2021c(b).

"Management" means the storage, packaging, treatment, transportation, or disposal, where applicable, of low-level radioactive waste.

"Management plan" means the low-level radioactive waste management plan adopted by the board pursuant to M.G.L. c.111H, § 12 to



provide for the safe and efficient management of low-level radioactive waste.

"Minimization plan" means the plan required by each generator which identifies actions to allow for "storage for decay" of short-lived radioisotopes, and actions to achieve source and volume minimization.

"Mixed waste" means low-level radioactive waste containing material that either (1) is listed as hazardous waste in 310 CMR 30.131 through 30.136 or (2) causes the low-level radioactive waste to exhibit any of the hazardous waste characteristics identified in 310 CMR 30.120.

"Person" means any agency or political subdivision of the federal government or the commonwealth, or of any state, any public or private corporation or authority, individual, firm, joint stock company, partnership, association, trust, estate, institution or other entity, and any officer, employee or agent of such person, and any group of such persons.

"Radioactive material" means any solid, liquid, or gas which emits radiation spontaneously.

"Radioactive material user" means any person who requires a license or registration with the Department of Public Health pursuant to 105 CMR 120.000 to use radioactive materials for any purpose.

"Radioactivity" means the transformation of unstable atomic nuclei by the emission of radiation.

"Source minimization" means minimizing the volume of radioactivity of low-level radioactive waste prior to its generation by such methods as: (1) substituting non-radioactive isotopes or radioisotopes with shorter half-lives where practicable; (2) avoiding unnecessary contamination of items during the use of radioactive materials; or (3) carefully segregating radioactive waste from non-radioactive trash.

"Storage" means the holding of low-level radioactive waste for treatment or disposal.

"Storage for decay" means a procedure in which low-level radioactive waste with a relatively short half-life is held for natural radioactive decay in compliance with applicable federal and state regulations.

"Treatment" means any method, technique, or process including source minimization, volume minimization, and storage for decay, designed to change the physical, radioactive, chemical, or

biological characteristics or composition of low-level radioactive waste in order to render such waste safer for management, amenable for recovery, convertible to another usable material or reduced in volume.

"Volume minimization" means treatment of low-level radioactive waste after its generation in order to minimize the physical dimensions of the waste and the space required for disposal.

"Waste" means low-level radioactive waste.

#### M1.40: Enforcement

The Department may issue orders to assure compliance with the regulations in this Part (M1), or to cease activity in violation of the regulations in this Part; it may revoke, suspend or modify licenses and impose a civil penalty or have the Attorney General bring an action to restrain, prevent or enjoin any conduct prohibited by this Part or compel action ordered by the Department, as stated in 105 CMR 120.000 Part A, General Provisions, Enforcement.

### OBJECTIVES

#### M1.50: Objectives

The following are the objectives of the regulations in this Part (M1):

(a) To protect public health and safety and the environment by ensuring that radioactive material users avail themselves of all the opportunities to produce less waste.

(b) To reduce the amount of waste requiring treatment, storage and disposal.

(c) To ensure waste material is well characterized so as to reduce disposal liabilities and conserve disposal capacity.

(d) To permit evaluation of the waste generation activity, allowing for optimal minimization controls.

(e) To identify opportunities to achieve source minimization, volume minimization and storage for decay. These opportunities shall include activities required in M.G.L. c.111H § 13, including avoiding unnecessarily contaminating items while using radioactive

materials; and segregating radioactive waste from non-radioactive trash.

(f) To be consistent with the promotion of responsible research and innovation.

#### M1.60: Statement and Plan Requirements

All radioactive material users and generators of low-level radioactive waste are required to examine their operations and institute waste minimization programs as follows:

(a) All radioactive material users, as well as all generators, of low-level radioactive waste must prepare a statement indicating the measures they have taken to minimize any waste that may result from their operations.

(b) Those persons whose operations result in 100 cubic feet or more of waste per annum, and such waste requires disposal, must develop and institute waste minimization programs predicated on detailed plans. The required elements of a waste minimization program are described in M1.70.

(c) A minimization statement or plan, as applicable, shall be submitted with each new application for a license to manufacture, produce, transfer, receive, acquire, own, possess, or use radioactive materials. Current licensees shall submit a minimization statement or plan within ninety days of the promulgation of these regulations. The minimization statement or plan shall be updated yearly as part of the annual survey required by Section 7 of Chapter 111H.

(e) Persons who do not require a license from the Department for their operations but require access to a waste facility licensed by the Department shall submit, pursuant to this Part, a statement or plan regarding their waste which shall be updated yearly as part of the annual survey required by Section 7 of M.G.L. c.111H.

(f) The Department shall evaluate each minimization statement or plan in accordance with the provisions of M1.50, M1.60, M1.70 and upon approval, shall issue a certificate.

(g) The approved minimization statement or plan shall be written into the license as a condition of the license as required in Part C of 105 CMR 120.000.



## M1.70: Waste Minimization Plan Content

A waste minimization plan shall include:

(a) A waste minimization policy statement that presents the generator's goals for achieving waste minimization, and assigns responsibility to an individual or group to accomplish the objectives. The plan shall be approved by the highest official of the company or institution or his/her designee, and include a statement committing to a defined implementation schedule.

(b) A summary report which characterizes the generator's waste streams and assesses the opportunities for waste minimization. The report shall include a systematic review of processes, current applicable technologies, procedures and cost requirements. An operational assessment of the generator's activities will be required in order to collect the necessary data and compile the summary report. Sample assessment forms and a flow chart illustrating the assessment overview can be found in the DPH "Low-Level Radioactive Waste Minimization Guidance". The following assessment activities are expected to be included in the waste minimization plan and will be used to evaluate the plan:

1. A description of the facility and the process or service that generates the waste. This may be accomplished by reviewing design, operating and maintenance documentation.

2. Identification and characterization of the waste streams which result from the process or service. Potential sources of information include process flow diagrams, analytical test data, waste shipment manifests, radioactive material purchase and inventory records.

3. Prioritization of the radioactive sources and waste streams to select one or more for minimization. Concerns which should be addressed when making this selection will include:

- minimization potential
- reclassification potential
- compliance with current and future regulations
- potential liability
- volume and activity of the waste
- cost/benefit relationship

4. Analysis and selection of a technically-feasible minimization technique or technology. The process or service that generates the waste will be analyzed relative to the candidate techniques or technologies. If techniques or technologies have been developed, and

minimization is believed to have reached optimum levels, the summary report will indicate what activities will allow minimization to continue.

5. Analysis of the direct and indirect capital costs and operating costs associated with the minimization activity as compared to on-site storage and increasing disposal costs.

6. Evaluation of both tangible and intangible benefits and detriments of minimization.

7. Evaluation of the progress or success of the minimization effort. This action should be undertaken periodically after minimization plans are instituted.

8. An operational assessment whenever a new product or substantial change in service is being considered.

9. Procedures which rely on reduction of the radioactivity of the waste through decay in storage, these should include the following:

(i) Identification of the radioisotopes and waste which can be considered for decay in storage, and development of a written set of procedures outlining handling and processing steps necessary to isolate those wastes.

(ii) Identification of an area where the storage for decay can occur, and evaluation of the size of the area to ensure it is spacious enough to accommodate all wastes to be accumulated through the entire decay cycle.

(iii) Identification of adjacent unrestricted areas to ensure adequate shielding is available to maintain radiation levels below specified limits.

(iv) Establishment of adequate security measures for the storage for decay area.

(v) Establishment of a radiation survey procedure to measure radiation levels in adjacent unrestricted areas at least weekly.

(vi) Development of written procedures to monitor the waste in the storage for decay area to ensure it has decayed to background levels prior to disposal.



(vii) Maintenance of all records for all storage for decay and disposal activities, especially radiation surveys.

(c) Specification of the considerations necessary to achieve the required goals. These considerations shall include:

1. The scope of work necessary to develop and implement the program;
2. A best estimate of the schedule for implementing each identified task;
3. Requirements for anticipated personnel, materials and equipment;
4. A range of cost estimates of all program elements; and
5. If a minimization program is already in place, the measures necessary to allow minimization to continue at an optimum level should be indicated.

(d) A statement describing how future business plans will evaluate source and volume minimization for the expected waste streams.

(e) A description of the strategies to be used to measure the success of the minimization program.

(f) A summary of employee training activities which ensure that:

- (1) All employees who work with radioactive materials have basic knowledge of common waste problems;
- (2) All workers involved directly with the minimization program have the necessary technological skills.

[Note: Guidance for the preparation of a minimization plan may be found in the Generator Guidance which is available from the Department.]



